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April 22, 1897, pp. 582-586, and to the illustrations given there. I venture, in this connection, to mention remarks printed in these *Publications*, Vol. III (1891), p. 249, Vol. VI (1894), p. 24, which relate to the problems discussed by Professor WOLF in the paper cited.

E. S. H.

DEDICATION OF THE FLOWER OBSERVATORY, UNIVERSITY OF PENNSYLVANIA.

On the afternoon of May 12th took place the exercises which marked the practical completion of the above-named observatory, though observations have been going on regularly there since last October.

The ceremony of the dedication was not elaborate, but all present appear to have found it very enjoyable.

A platform had been erected in front of the equatorial building for the accommodation of the speakers. In front were seated about four hundred invited guests.

Provost C. C. HARRISON, of the University, in a short introductory address, presented the speaker of the day, Professor SIMON NEWCOMB. Provost HARRISON gave a brief outline of the bequest of the founder, REESE WALL FLOWER. This consists of one hundred acres of valuable land adjoining the city of Philadelphia, and upon which the observatory now stands. It is not known how Mr. FLOWER came to make this bequest, as he had never showed any special interest in astronomy.

Professor NEWCOMB gave a very interesting paper upon "The Problems of Astronomy," which was followed by short addresses of an informal nature by Dr. W. R. WARNER, Mr. BRASHEAR, Miss PROCTOR, Dr. BARKER, and C. L. DOOLITTLE.

The exercises were followed by a very enjoyable reception at the residence of the Director.

RECORD OF EXPERIMENTS WITH THE MOVING FLOOR OF THE 75-FOOT DOME OF THE LICK OBSERVATORY.

The following summary of experiments with the moving floor of the 75-foot dome may appropriately be recorded here. The original data are scattered in various places, and if brought together, they will be useful in subsequent comparisons.

The idea of a moving floor was first suggested to the Lick Trustees by Sir HOWARD GRUBB, F. R. S. The floor was to rise

16½ feet. Four nuts were fixed to its edge, and four vertical screws in them were to be driven by a three-cylindred water-engine in the basement. The available pressure was only seventy-two pounds per square inch. This plan was tried (against my advice) and failed. The floor never could be made to rise its whole height in less than an hour (approximately). The screws were taken out in May, 1888, and the floor was lifted by four hydraulic jacks. The supply of water to these jacks was regulated by four lock-valves, whose scales were divided into six parts. Up to 1895 these were used ⅙ open.

May 31, 1888.—Floor moves *down* in 5^m 45^s (16½ feet); *up* in 12^m 0^s. Five hundred pounds were then added to the counter-weights.

June 15, 1888.—Floor moves *down* in 5^m 33^s; *up* in 7^m 43^s.

Experiments between 1888 and 1895 are not here set down.

August 28, 1895.—Valves ⅙ open; the floor moves *down* in 5^m 42^s; *up* in 9^m 30^s. The heavy mahogany chair (needed in most photographic work) was then removed from the floor. The floor moved *down* in 6^m 40^s; *up* in 9^m 10^s. About this time the capacity of the waste pipes from the jacks was increased. The capacity of the supply pipe should also be increased, but it has not been done, on account of the expense.

August 19, 1896.—Valves wide open; floor moves *down* in 5^m 20^s; *up* in 10^m 30^s.

April 29, 1897.—Added 592 pounds of lead to the counter-weights of the moving floor. The valves were ⅜ open. After adding the extra weights, the floor moved *down* in 6^m 30^s, and *up* in 9^m 20^s. The valves were then opened wide, and the floor moved *down* in 5^m 5^s; *up* in 9^m 30^s. The valves were left wide open. The packing of the rams will account for small differences in time, according as it is tight or loose. The jacks, on the whole, do not work as efficiently in 1897 as in 1888. This is probably due to the fact that they are not absolutely vertical, especially in the upper eight feet of their play. One single ram of the proper length would have been a better device than the present telescopic arrangement. All the other machinery of the moving floor (see *Engineering*, Vol. 46, p. 204, 1888) is now in excellent order.

EDWARD S. HOLDEN.

April 30, 1897.